

REMARKS

In response to the telephone request for a response to an Election/Restriction Requirement, the Applicants provisionally elected Group I, comprising claims 1-6. The Applicants hereby affirm this election. Claims 1-6 thus remain pending in the present application, with claims 7-9 standing withdrawn.

Claims 1-6 and 9-11 stand rejected under 35 U.S.C. § 112, second paragraph. Claim 4 stands rejected for apparently failing to further limit the subject matter claimed in its parent claims. The October 23, 2003 Office Action also contains an incomplete sentence concerning claim 1. In accordance with the Examiner's instructions in a telephone conversation on January 16, 2004, no response regarding claim 1 is required.

Claims 1-3 and 6 stand rejected under 35 U.S.C. § 102(b) as anticipated by U.S. Patent No. 5,884,475 to Hofmann, *et al.* ("Hofmann").

Claims 1-3 and 5-6 stand rejected under 35 U.S.C. § 102(b) as anticipated by EPO patent document no. EP 0 555 746 ("EP 0 555 746").

Claims 1-3 and 5-6 stand rejected under 35 U.S.C. § 102(b) as anticipated by WO97/01387 (corresponding to U.S. Patent No. 6,444,177 to Müller, *et al.*) ("Müller").

Claims 1 and 5-6 stand rejected under 35 U.S.C. § 102(b) as anticipated by WO97/36676 ("WO97/36676").

Finally, claim 4 stands rejected under 35 U.S.C. § 103(a) as unpatentable over any of the foregoing references.

Rejections under § 112, Second Paragraph: Regarding the rejection of claim 4, the Applicants respectfully submit that in the context of the claims and the specification, it is clear that claim 4 adds the structural limitation of the placement of the baffle plate in a bypass passage adjacent to the main exhaust line. Nonetheless, the Applicants have amended claim 4, solely for clarity, to explicitly recite that “the exhaust gas flows through a main-flow exhaust system section” before reciting the location of the plate in the bypass branch.

Reconsideration and withdrawal of the pending § 112, second paragraph rejections is respectfully requested.

Rejections Under § 102(b): The Applicants respectfully traverse the pending § 102(b) rejections on the grounds that the cited references fail to disclose the present invention as recited in claims 1-6.

The present invention is directed to a simplified, lower cost, exhaust gas cleaning system in which a reducer is injected into an exhaust system onto a heat source, such as a deflector plate arranged substantially parallel to the exhaust flow, or a microwave generator. With either the generator, or the plate arranged so that the reducer directly impinges on the plate, the Applicants found that sufficient vaporization of the reducer could be achieved with a considerably simpler, lower cost structure than previously known. Application at 2:28-31.¹ None of the cited references discloses or suggests this improved system.

¹ For clarity, the Applicants have amended claim 1 to expressly recite that the reducing agent is directed under pressure “at an angle substantially perpendicular to the deflector surface.” The Applicants believe this feature is already inherently claimed, as the last subparagraph of claim 1 already requires the reducer to be directed under pressure “onto” the deflector surface. Thus, the foregoing amendment is made solely for purposes of clarity, with no alteration or surrender of claim scope to be inferred.

Hofmann: The Hofmann reference is directed to a valve control system, which controls reducer supply to an engine's exhaust. All that is disclosed regarding components in the exhaust flow is a nozzle 22 spraying reducer into the exhaust gas upstream of the catalyst C. Hofmann Figs. 1, 3-4. Hofmann thus does not disclose or suggest directing reducer under pressure onto any surface (let alone directing reducer substantially perpendicularly onto a heatable deflector surface) or a microwave generator, as recited in claim 1.

Nor does this reference disclose or suggest a vaporizer or a heat source in the exhaust gas flow path (*i.e.*, "upstream of the nitrogen oxide reduction catalytic converter"). The Applicants note that the portion of Hofmann cited as disclosing the present invention's vaporizer and heat source onto which the reducing agent is directed, Hofmann at 9:3-9, in fact does not teach these elements. The cited portion is actually in a section of the Hofmann specification discussing purging of a small volume of urea solution into the exhaust pipe with compressed air -- when the exhaust pipe "*no longer has exhaust gas 5 flowing through it.*" Hofmann at 8:62-9:9 (quoted language at 9:2-3). In other words, Hofmann only teaches that a small amount of urea injected into the exhaust pipe *after* the engine has been run may come to rest on hot pipe walls and evaporate, with the resulting ammonia likely being captured by downstream catalytic converter C (rather than cleaning any exhaust gas. *Id.* Accordingly, Hofmann's observation (that the walls of the exhaust pipe may still contain enough heat after engine shutdown to evaporate urea purged from the urea injection line) teaches nothing with respect to the present invention's use of a vaporizer or heat source within the exhaust gas while the engine is operating.

Hofmann therefore fails to disclose or suggest the present invention.

EP 0 555 746: As with Hofmann, EP 0 555 746 does not disclose or suggest directing reducer flow substantially perpendicularly to a heatable deflection surface. As shown in EP 0 555 746 Fig. 1, a spray nozzle 9 axially disposed in the exhaust pipe releases reducer into the exhaust stream, and the exhaust/reducer mix then enters a honeycomb-shaped structure 34. EP 0 555 746 teaches away from the present invention's low cost exhaust cleaning system by using a relatively complex (and therefore more expensive) component, honeycomb structure 34 (shown in Fig. 2). In addition to its greater flow resistance, the lateral walls of the element 34 honeycomb preclude any chance for a reducing agent to be "directed under pressure at an angle substantially perpendicular to the deflector surface," as in the present invention.

EP 0 555 746 therefore also fails to teach or suggest the present invention.

WO97/01387 (Müller): Müller, like EP 0 555 746, discloses an axially-disposed nozzle 22 spraying reducer into the exhaust gas flow essentially parallel to the walls of a tube 61, and the use of substantial additional flow-resisting elements (such as catalysts 28, 36) to achieve the vaporization/ hydrolyzing achieved by present claim 1's simple, low cost direct heat source (*e.g.*, a plate arranged parallel to the exhaust flow or a microwave generator). Accordingly, Müller also fails to disclose or suggest the invention recited in claim 1.

WO97/36676: This reference discloses a vaporizer 60 with an external electrical heat source 64 that is not in the exhaust flow, *i.e.*, neither "upstream of the nitrogen oxide reduction catalytic converter" nor "disposed in the exhaust gas" as recited in claim 1. WO97/36676 Fig. 2. This reference also fails to

disclose or suggest claim 1's direct impingement onto a heatable deflector surface immersed in the exhaust gas stream. WO97/36676 therefore fails to disclose or suggest the present invention's simple, low cost reducer vaporization/hydrolyzing exhaust gas cleaning system.

In view of the foregoing, the Applicants respectfully submit that none of the cited references disclose or suggest all the features recited in claim 1 and its dependent claims 2-6. Accordingly, the Applicants respectfully request the pending § 102(b) rejections of claims 1-3 and 5-6, and the § 103(a) rejection of claim 4, be reconsidered and withdrawn.

CONCLUSION

In view of the foregoing amendments and remarks, the Applicant submits claims 1-6 are in condition for allowance. Early and favorable consideration and issuance of a Notice of Allowance for these claims is respectfully requested.

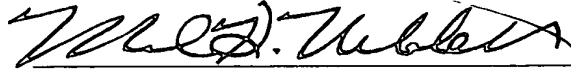
If there are any questions regarding this amendment or the application in general, a telephone call to the undersigned would be appreciated since this should expedite the prosecution of the application for all concerned.

If necessary to effect a timely response, this paper should be considered as a petition for an Extension of Time sufficient to effect a timely response, and please charge any deficiency in fees or credit any overpayments to Deposit

Account No. 05-1323 (Docket #225/48876US).

January 21, 2004

Respectfully submitted,

A handwritten signature in dark ink, appearing to read "Donald D. Evenson", written over a horizontal line.

Donald D. Evenson
Registration No. 26,160
Mark H. Neblett
Registration No. 42,028

CROWELL & MORING, LLP
P.O. Box 14300
Washington, DC 20044-4300
Telephone No.: (202) 624-2500
Facsimile No.: (202) 628-8844